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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,604	04/05/2000	Dieter Mueller	81208-246298	6492

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EXAMINER	
LEE, HWA S	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/543,604	MUELLER ET AL.	
	Examiner	Art Unit	
	Andrew Hwa S. Lee	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/18/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remarks

This Office Action is in response to Applicant's Amendment of 9/10/04. Claims 1-23 are pending. Claims 1, 5, 6 have been amended.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1, and thus depending claims 2-10, recite "at least one diffraction grating for..." and also "...receiving light from each diffraction grating." The recitation of "each diffraction grating" contradicts the recitation "at least one diffraction grating" in the instance where there is only one diffraction grating since "each diffraction grating" suggests there are more than one diffraction grating. Also the recitation of "a second diffraction grating" make it confusing if the "second diffraction grating" is one of the "at least one diffraction grating." For examination purposes, the reflective surfaces clause will be interpreted as, "a plurality of reflective surfaces for receiving light energy from each of said at least one diffraction grating. each of said reflective surfaces separate from said specimen." The "second diffraction grating" will be interpreted as a "receiving diffraction grating"

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 1-7, 10-13, 16-18, 22, and 23,** *as understood by the examiner,* are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller (6,271,925) in view of Elssner et al. (DD 261422).

As for **claims 1, 2, 6, 7, 11, 16, 17, and 18,** Muller shows an apparatus and method for measuring two opposite surfaces of a body comprising:

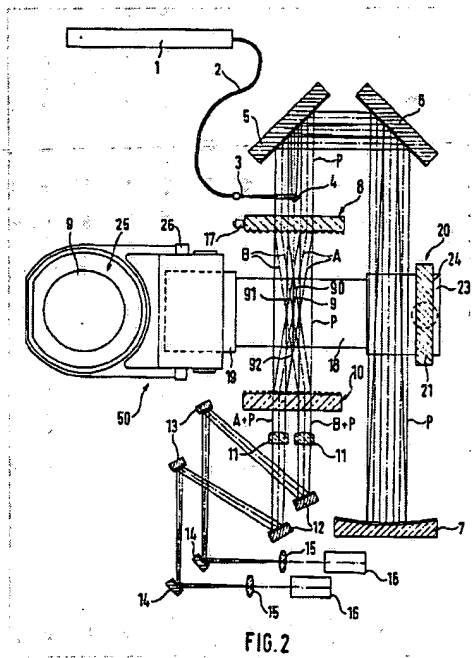


FIG.2

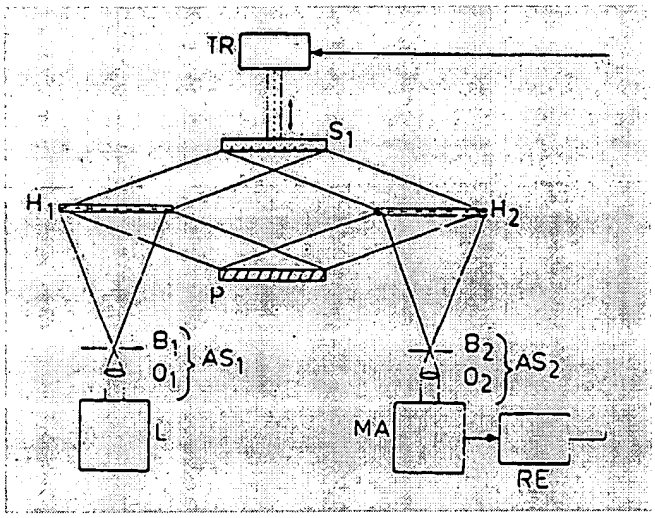
a collimator for collimating light energy received from a light energy generating device into two separate channels;

at least one diffraction grating for receiving light energy transmitted from each channel of said collimator and passing nonzero order light energy toward said specimen;

a second diffraction grating for receiving light reflected from said specimen;

wherein said second diffraction grating is mounted substantially perpendicular to said specimen and said plurality of reflective surfaces

Muller does not show the reflecting surface being used as reference surfaces. Elssner et al (Elssner hereinafter) show an interferometer for measuring surface smoothness of an object wherein a reference reflecting surface is used to reflect the other first order diffraction (-1 order diffraction). The use of the reference surface allows for better quality of measurements due to the use of combining a first order diffraction with another first order diffraction rather than combining a first order diffraction with a zero order diffraction where intensities of the two orders can be different. In addition, the recombining of beams originating from the same portion of the illumination beam remain constant thus removing errors due to inconsistencies of the original beam.



Therefore, at the time of the invention, one of ordinary skill in the art would have been motivated to modify Muller to use a reference reflecting surface of Elssner in order to obtain better surface measurements. Furthermore, since Muller teaches the measuring of two surfaces of the specimen, one of ordinary skill in the art would have used two reference surfaces ("a plurality of reflective surfaces"), each reference surface corresponding to each specimen surface

in order to provide a reference surface for the specimen surface. As for **claims 11 and 17**, one of ordinary skill in the art would have placed each reference surfaces parallel to their respective specimen surface wherein the reference surface receives nonzero order energy since Elssner shows the placement of a reference surface parallel to the specimen surface receiving nonzero order energy in order to direct the beam to the second diffraction grating.

As for **claims 4, 13**, Muller shows the calibrating of the interferometer in column 3, lines 17+.

As for **claims 5, 16, and 23** the image aspect ratio is altered by the grating and mirrors (12-14).

2. **Claims 3, 10, 12, and 22,** *as understood by the examiner,* are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller and Elssner as applied to claims 1, 2, 6, 7, 11, 17, and 18 above, and further in view Kulawiec et al (5,719,676). Muller and Elssner fail to expressly show the blocking of zero order light. Kulawiec et al (Kulawiec hereinafter) shows in Figure 7, the measurement of opposite sides of a body wherein zero order light is blocked (column 9, second paragraph). At the time of the invention, one of ordinary skill in the art would have modified Muller and Elssner to block zero order light in order to obtain clearer measurements by blocking zero order light from interfering with the combined beam that contains measurement information.

3. **Claims 8, 9, 14, 15, 19, 20, and 21** *as understood by the examiner,* are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller and Elssner as applied to claims 1, 2, 6, 7, 11, 17, and 18 above, and further in view of in view of Ai et al. (5,471,303).

Muller and Elssner fail to expressly show an interferometric normal incidence inspection device. Ai shows a combination of two interferometers for surface profile measurement in a single apparatus comprising a light emitting device (34 or 36), a beamsplitter (24), a collimator (lens in 14), and a semitransparent reflecting mirror (24). Ai et al suggest the use of a second normal incident interferometer to improve the accuracy of height measurements made by a first normal incident interferometer. At the time of the invention, one of ordinary skill in the art would have used a second interferometer in order to improve the measurements of the first interferometer since the second interferometer provides a redundant measurement or the second interferometer has better a range of height measurements or improved accuracy.

Response to Arguments

4. Applicant's arguments filed 8/27/03 have been fully considered but they are not persuasive.

5. In response to Applicant's argument the claims now distinguish the specimen from the reflective surfaces, the Examiner agrees that the amended claim now clearly distinguishes one from the other.

6. In response to applicant's arguments of claims 11 and 17 against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

7. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, a reference surface for comparing the reference surface to a sample surface is knowledge generally available to one of ordinary skill in the art. The applicant requests a reference showing the use of a reference surface for comparing to a sample surface. In response, the examiner cites US Patent No. 5,923,425, where a reference surface (122) is used to compare with the test surface (134) in a grazing incidence interferometer.

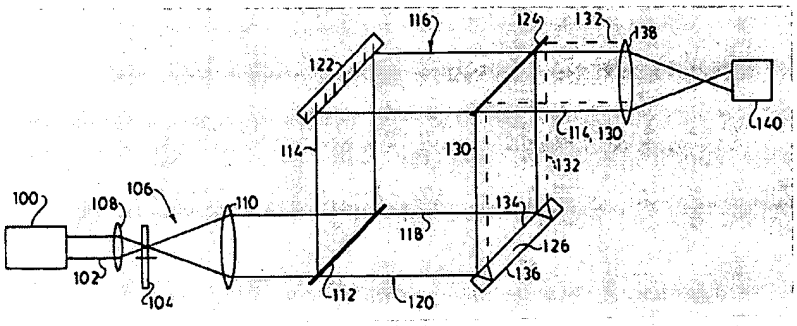


FIG. 6

8. In response to applicant's argument that Muller and Elssner can not be combined, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this instance, Ellsner teaches the use of a reference surface in a grazing incidence interferometer. It was that particular teaching, and no other feature or element, that the examiner was looking to. The applicant further argues that the combination would not be operable in the manner alleged. The examiner respectfully disagrees since according to the applicant's admission in the specification, the combination would work. The applicant does not cite clear reasons why the use of a reference mirror in the apparatus of Muller would not work or is not enabling. It appears that the applicant believes that the examiner was trying to incorporate the hologram of Ellsner in the combination. As previously stated, the examiner was looking to Ellsner for the use of a reference mirror only and no other element including the hologram.

9. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The examiner was not looking to the motivation from Applicant's

specification, but rather knowledge generally available to one of ordinary skill in the art. One of ordinary skill in the art knows that in an interferometer where the combination of two beams are analyzed, the intensity of the two beams should be close to each other so that one beam does not overwhelm the other beam. It is also knowledge generally available to one of ordinary skill in the art that beams of different diffraction orders also differ in intensity and that if diffracted beams are used for combining, combining beams of the same order is preferred. For example, Medecki (US 5,835,217) in states, "...the relative intensities of test wave 77 and reference wave 79 are controlled by choosing beams of appropriate order from diffraction grating 70 as test beam 72 and reference beam 74. Generally, reference beam 74 will be a zero or low order beam from grating 70. Such low order beams generally have a rather high intensity compared to the higher order beams produced by a diffraction grating." One of ordinary skill in the art would recognize that using a zero order beam with a first order is acceptable acceptable, but that using a first order beam with another first order beam would be better.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

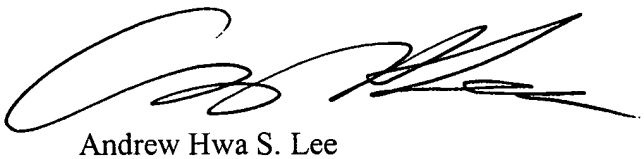
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa S. Lee whose telephone number is 571-272-2419. The examiner can normally be reached on Tue-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Andrew Hwa S. Lee
Examiner
Art Unit 2877